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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,411	11/15/2006	Yoshihiro Naruse	TIP-06-1204	7152

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EXAMINER	
MATZEK, MATTHEW D	
ART UNIT	PAPER NUMBER
1786	

NOTIFICATION DATE	DELIVERY MODE
12/21/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pto.phil@dlapiper.com

Office Action Summary	Application No.	Applicant(s)	
	10/589,411	NARUSE ET AL.	
	Examiner	Art Unit	
	MATTHEW D. MATZEK	1786	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 September 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *132-134,136-150,158 and 159* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *132-134,136-150,158 and 159* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 August 2006 and 17 May 2010* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/10*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/28/2010 has been entered.

Response to Amendment

2. Claims 132 and 133 have been amended. New claims 158 and 159 have been added. The new and amended claims contain no new matter. Claims 132-134, 136-150, 158, and 159 are pending. The previous prior art rejection has been withdrawn in light of art that more closely resembles the claimed invention.

Claim Rejections - 35 USC § 112

3. Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. Process Control Corp. v. HydReclaim Corp., 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "alloy" in claims 132-134, 136-150 is used by the claim to mean the "island" of the "island-in-sea" composition, while the accepted meaning is "a combination of two materials." The term is indefinite because the specification does not clearly redefine the term. In the specification, Applicant has used the term "polymer alloy" to describe a composite fiber comprising an islands-in-sea configuration. The "alloy" is the composite of both phases of the fiber. The claimed nanofiber formed consists of the "island" phase alone, and is made of only one polymer; therefore, the nanofibers are not made of a thermoplastic polymer alloy; only the lager fiber consisting of both phases constitutes an alloy.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 132-134, 136, 142-144, 158, and 159 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishioi et al. (US 5,290,626).

a. Nishioi et al. disclose a web of fibers consisting of conjugate (alloy) polymeric island-in-sea microfibers, according to the melt-blown process, followed by the removal of the "sea" phase of the fiber revealing a web of "island" fibers (abstract). A nonwoven fabric of microfibers of the present invention can be obtained by entangling, interlacing, or bonding the fibers, followed by the removal of the sea component (col. 2, lines 23-29). Example 1 provides for melt-blown nonwoven fabric comprising nanofibers well within the diameter range of 5-500 nm and a basis weight of 50 gsm. The nonwoven fabric may be used as a filter (col. 6, lines 1-7).

b. The applied reference fails to provide what percentage of the nanofibers is in the sum Pa of single fiber ratios or the index of Pb; functions discussed in the specification by Applicant to describe uniformity in nanofiber diameter. The nanofiber diameters as well as the percentage of the nanofibers that are of a given diameter are both result-effective variables affecting the permeability, filter efficiency and effectiveness of the overall filter mat. Finer fibers will filter out smaller particulates than coarser fibers and uniformity in fiber diameter provides increased uniform filter performance across and through filter media. Consequently, absent a clear and convincing showing of unexpected results demonstrating the criticality of the claimed sum Pa of single fiber

ratios, index Pb of single fiber diameters, as well as the fiber diameters themselves, it would have been obvious to one of ordinary skill in the art to optimize these result-effective variables by routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977).

c. The freeness of the nanofiber mat as well as the average pore area and density are relative result-effective variables affecting permeability of the nanofiber mat. Decreasing freeness values as well as average pore area size increases the effectiveness of the filter by preventing the passage of ever smaller particles. An increase in density also leads to an increase in effectiveness of the filter in that there is less open space for particles to pass through. Consequently, absent a clear and convincing showing of unexpected results demonstrating the criticality of the claimed freeness, density and average pore size, it would have been obvious to one of ordinary skill in the art to optimize these result-effective variables by routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977).

d. Claim 142 is rejected as the smoothness of the nanofiber layer of Nishioi et al. is a result-effective variable affecting the ability of the media being filtered to pass through the filter. Higher smoothness levels provide for less friction between fluid and filter causing a lower pressure drop through the filter, which extends the lifetime of the filter. Consequently, absent a clear and convincing showing of unexpected results demonstrating the criticality of the smoothness, it would have been obvious to one of ordinary skill in the art to optimize this result-effective variable by routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977).

e. Claims 143 and 144 are rejected as the nonwoven fabric may be made with polypropylene which has a melting point of 165°C or higher (claim 7).

5. Claims 137-141, and 145-150 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishioi et al. (US 5,290,626) as applied to claim 132 above, and further in view of Chung et al. (US 2003/0106294 A1). Nishioi et al. fail to provide for a thickness, pore size, permeability, and additional materials to be incorporated into the nanofiber mat.

a. Chung et al. disclose nanofiber structures that may be used in filtering (abstract). The structures may include a random distribution of fine polymer fibers having diameters of less than 200 nanometers [0006]. The most preferred fiber size set forth in Chung et al. provides for nanofibers ranging from 50 to 500 nanometers. This diameter range clearly falls within the claimed diameter range [0012]. The disclosure of Chung et al. provides for a layer of fibers ranging in diameter from 50 to 500 nanometers without being blended with fibers of larger diameter. The polymer nanofibers may be formed via melt-spinning and be made of Nylon 6 [0004,8]. The random distribution of nanofibers forms a mat and may be adhered to a supporting substrate [0013]. This fine fiber mat may have a thickness of up to 100 times the fiber's diameter, yielding mats of up to 50 microns [0025]. The basis weight of the mat may be as low as 0.1 g/m^2. The space between fibers may range from 0.1 to about 10 microns [0006]. A coarse fiber layer of Chung et al. may have a permeability as low as 1.67cc/cm^2/sec [0058, conversion done by Examiner], therefore the fine fiber layers would necessarily meet the claimed permeability as fine fiber layers of a filter have smaller pores leading to lower permeabilities when compared to coarse fiber layers.

b. Nishioi et al. and Chung et al. are from the same field of endeavor (i.e. nanofiber filters).

c. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to have modified the nanofiber mat of Nishioi et al. with the invention of with the thickness, pore size, permeability of Chung et al. as well as the additional material from the filter of Chung et al. with the motivation of providing guidance as to appropriate physical properties for a filter material as well as reinforcing the filter layer as disclosed by Chung et al.

d. Claim 141 is rejected as the fine fiber filter of Chung et al. has holes (pores) ranging from 0.01 to 25 microns [0006] therefore, the applied article would have zero holes with a diameter of 50 microns or more per cm^2. Claim 143 is rejected as the nanofibers may be made of Nylon 6, a polyamide, which has a melting point of 216°C. The fine fiber layer may be blended with other fibers [0014] and as discussed previously the diameter of the fibers used as well as the percentage of fibers of a given diameter are result-effective variables affecting the permeability, filter efficiency and effectiveness of the overall filter mat. Finer fibers will filter out smaller particulates than coarser fibers, but coarser fibers provide stability to the fine fiber layer. Consequently, absent a clear and convincing showing of unexpected results demonstrating the criticality of the claimed fiber diameters as well as their representation on percentage basis in the layer, it would have been obvious to one of ordinary skill in the art to optimize these result-effective variables by routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977).

e. Claims 147-149 are rejected as the fine fiber layer may be laminated to conventional filter media [0061] such as woven or non-woven substrates (claim 121) and may serve as a compound synthetic paper, filter, separator, abrasive or part of a medical product or circuit board.

f. Claim 150 is rejected as it would have been obvious to one of ordinary skill in the art at the time of the invention to have molded the fine fiber layer to fit within a filtering apparatus. This is easily done since the fibers are made of a thermoplastic polymer.

Double Patenting

6. Claims 132-136, 138-140, 142, 145, 146, 150, 158, and 159 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-19 of copending Application No. 11/587,128.

a. Although the conflicting claims are not identical, they are not patentably distinct from each other because the applied reference fails to provide what percentage of the nanofibers are in the sum Pa of single fiber ratios or the index of Pb; functions discussed in the specification by Applicant to describe uniformity in nanofiber diameter. The nanofiber diameter as well as what percentage of the nanofibers are of a given diameter are result-effective variables affecting the permeability, filter efficiency and effectiveness

of the overall filter mat. Finer fibers will filter out smaller particulates than coarser fibers and uniformity in fiber diameter provides increased uniform filter performance across and through filter media. Consequently, absent a clear and convincing showing of unexpected results demonstrating the criticality of the claimed sum Pa of single fiber ratios, index Pb of single fiber diameters, as well as the fiber diameters themselves, it would have been obvious to one of ordinary skill in the art to optimize these result-effective variables by routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Claims 135, 139, 140, 142, 145, 146 and 150 are obvious over application '128 for the same reasons as set forth in the Chung et al. rejection.

b. The article of the '128 application may be used in the manner set forth in claims 151-155. Claims 136 and 138 are rejected as it would have been obvious to one or ordinary skill in the art to have selected a basis weight and density within the claimed ranges since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

7. Claims 132-135, 139, 140, 142, 145-147, 149 and 150 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 3, 4, 7-10, 12-16 and 35 of copending Application No. 11/578,926.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the applied reference fails to provide what percentage of the nanofibers are in the sum Pa of single fiber ratios or the index of Pb; functions discussed in the specification by Applicant to describe uniformity in nanofiber diameter. The nanofiber diameter as well as what percentage of the nanofibers are of a given diameter are result-effective variables affecting the permeability, filter efficiency and effectiveness of the overall filter mat. Finer fibers will filter out smaller particulates than coarser fibers and uniformity in fiber diameter provides increased uniform filter performance across and through filter media. Consequently, absent a clear and convincing showing of unexpected results demonstrating the criticality of the claimed sum Pa of single fiber ratios, index Pb of single fiber diameters, as well as the fiber diameters themselves, it would have been obvious to one of ordinary skill in the art to optimize these result-effective variables by routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Claims 135, 139, 140, 142, 145, 146 and 150 are obvious over application '926 for the same reasons as set forth in the Chung et al. rejection. The article of the '926 application may be used in the manner set forth in claims 151-155.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

8. Claims 132-135, 144, 145, 146 and 150 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim1-16 of U.S. Patent 7,666,504.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the applied reference fails to provide what percentage of the nanofibers are in the sum Pa of single fiber ratios or the index of Pb; functions discussed in the specification by Applicant to describe uniformity in nanofiber diameter. The nanofiber diameter as well as what percentage of the nanofibers are of a given diameter are result-effective variables affecting the permeability, filter efficiency and effectiveness of the overall filter mat. Finer fibers will filter out smaller particulates than coarser fibers and uniformity in fiber diameter provides increased uniform filter performance across and through filter media. Consequently, absent a clear and convincing showing of unexpected results demonstrating the criticality of the claimed sum Pa of single fiber ratios, index Pb of single fiber diameters, as well as the fiber diameters themselves, it would have been obvious to one of ordinary skill in the art to optimize these result-effective variables by routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Claim 150 is obvious over '504 patent for the same reasons as set forth in the Chung et al. rejection. The article of the '504 patent may be used in the manner set forth in claims 151-155.

9. Claims 132-135, 139, 140, 142, 143-150 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 4, 8, 10-12, 16-19, 53, 56, 57 and 59 of copending Application No. 10/532,082.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the applied reference fails to provide what percentage of the nanofibers are in the sum Pa of single fiber ratios or the index of Pb; functions discussed in the specification by Applicant to describe uniformity in nanofiber diameter. The nanofiber diameter as well as what percentage of the nanofibers are of a given diameter are result-effective variables affecting the permeability, filter efficiency and effectiveness of the overall filter mat. Finer fibers will filter out smaller particulates than coarser fibers and uniformity in fiber diameter provides increased uniform filter performance across and through filter media. Consequently, absent a clear and convincing showing of unexpected results demonstrating the criticality of the claimed sum Pa of single fiber ratios, index Pb of single fiber diameters, as well as the fiber diameters themselves, it would have been obvious to one of ordinary skill in the art to optimize these result-effective variables by routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Claims 135, 139, 140, 142, 145, 146 and 150 are obvious over application '926 for the same reasons as set forth in the Chung et al. rejection. The article of the '082 application may be used in the manner set forth in claims 151-155.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

10. Applicant's arguments with respect to claims 132-134, 136-150, 158, and 159 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW D. MATZEK whose telephone number is (571)272-2423. The examiner can normally be reached on M-F, 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on 571.272.1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Matthew D Matzek/
Examiner, Art Unit 1786